

Considerations in Pilot Testing of Arsenic Treatment Processes

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Abstract

Implementation of the new drinking water standard for arsenic will require many communities throughout the country to install new treatment facilities to remove this constituent. The current treatment processes which have been shown to be effective for arsenic removal include membrane processes such as reverse osmosis and nano-filtration, ion exchange, adsorption, and coagulation-precipitation-filtration processes. Selection of the appropriate technology for each water system will depend on many factors especially the size of the community and its economic situation, and the characteristics of the water which will be treated. Because arsenic removal technology is in an early stage of development, and because there is such a wide range of candidate processes, it will be essential to test the most promising technologies at the pilot scale prior to selecting and designing the full scale system.

The objectives of pilot testing include determination of the best treatment technology for each community, generate data which can be used in design of the prototype, identify the expected level of performance for the treatment process, establish optimum operating conditions for the technology, generate operator experience with the treatment process, and develop information to enable an estimate of the treatment costs. This paper will discuss the major aspects associated with designing and conducting pilot tests of arsenic treatment processes. The topics to be covered will include: 1) the scale of the pilot process, 2) identification of the variables to be tested, 3) the duration of the testing, 4) the data to be collected, and 5) procedures for evaluating the data to provide the most useful information in scaling up to a full-scale plant. Emphasis will be placed on applications where ground water is to be treated to provide water supply for communities which have no existing water treatment.

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